

3 1761 11968197 1

9D22

TO

THE ROYAL COMMISSION ON COAL

(1959)

Submission of

The Drumheller Coal Operators Association

DRUMHELLER

ALBERTA



THE HISTORY OF THE
CITY OF BOSTON

Edited by
THE BOSTONIAN LAW LIBRARY
BOSTON, 1892

To
THE ROYAL COMMISSION ON COAL
(1959)

Submission of
The Drumheller Coal Operators Association
Drumheller, Alberta



Digitized by the Internet Archive
in 2024 with funding from
University of Toronto

<https://archive.org/details/31761119681971>

TABLE of CONTENTS

| | Page |
|--|------|
| Letter of Qualification | 1 |
| Introduction | 2 |
| General | 3 |
| Figure 1, Drumheller Coal Area, Alberta | |
| Figure 2, Drumheller Coal Market Area | |
| Table A, Details of Alberta Coal Production 1937 - 1958 incl. | 4 |
| Figure 3, Details of Alberta Coal Production 1937 - 1958 incl. | |
| Geology | 5 |
| Coal Characteristics | 5 |
| Mining Progress | 6 |
| Table B, Drumheller Field Statistics | 8 |
| Production History | 9 |
| Table C, Coal Output Drumheller Area by Months, 1958 - 1959 | 11 |
| Markets | 12 |
| General Statement | 13 |
| Summary | 13 |
| Proposals | 16 |
| Figure 4, Drumheller Area, Production & Employment Record | |

3220 - 1st Street S.W.,
Calgary, Alberta,
January 21, 1960.

Telephone:
CH 3-4363

Royal Commission on Coal (1959).

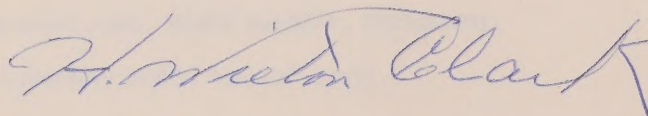
Letter of Qualification

The writer has been requested by Mr. S. G. McMullen, President of the Drumheller Coal Operators Association, Drumheller, Alberta, (hereinafter called D.C.O.A.) to submit a brief to your Commission.

I am a graduate in Mining Engineering of the University of Alberta (B.Sc. in M.E.) and a member of the Association of Professional Engineers of Alberta. I am also a member of the Institution of Mining Engineers (United Kingdom) and of the Canadian Institute of Mining and Metallurgy. I hold Mine Managers' and Mine Surveyors' certificates for the Provinces of Alberta and British Columbia under the Coal Mines Regulation Acts of those provinces.

I have had in excess of thirty years experience as a Mining Engineer, Mine Manager, General Superintendent and General Manager of coal mining properties. I have personal knowledge of operations and administration in the Drumheller area, having been General Manager of the Commander and Atlas Coal Mines, now Century Coals Limited, for $3\frac{1}{2}$ years from 1943 to 1947. Since that period I have from time to time acted as a consultant for mines in the same area.

Yours very truly,



H. Wilton-Clark, P. Eng.

HWC:t

To: The Secretary, of the
Royal Commission on Coal (1959),
P.O. Box 127, Postal Station "D"
Ottawa, Canada.

INTRODUCTION

The Drumheller Coal Operators Association has a membership of four operating coal mining companies. These four companies produce more than 95% of the coal mined in the Drumheller Valley. The companies are:

| | |
|--------------------------------------|-------------|
| Amalgamated Coals Limited | East Coulee |
| Century Coals Limited | East Coulee |
| Federated Co-Operatives Limited | Drumheller |
| Red Deer Valley Coal Company Limited | Nacmine |

The mines are fully equipped with both surface and underground plants to produce over one million tons of coal per year.

As will be shown in the present submission, the member companies of the D.C.O.A. have problems chiefly related to marketing and which they consider peculiar to their own industry. It is principally for this reason that the presentation is made.

Coal in Western Canada has always been divided into two categories:

- (1) Coals which are primarily consumed in homes and space heating. These are called "domestic" coals.

Drumheller coal is the outstanding example of this.

- (2) Industrial coals used primarily, until recently, as railway locomotive fuel and among other uses, where suitable, production of coke. Such coals are commonly called "steam" coals.

To some slight extent there is an overlap in the use of both types

but fundamentally domestic and steam coals serve entirely different markets.

Table A and Figure 3 show:

- i. Total Alberta Coal production, period 1937 to 1958
- ii. Total Alberta Steam coal production, same period.
- iii. Total Alberta Domestic coal production, same period.
- iv. Drumheller Area production, same period.

The importance of Domestic Coal in general, and Drumheller Coal in particular, is apparent.

GENERAL.

Location

Figure 1 shows the location of Drumheller relative to Calgary and Edmonton; and the Saskatchewan and British Columbia boundaries. It also shows an enlargement of the actual Drumheller area covering locations extending from Nacmine on the northwest through Drumheller to East Coulee on the south-east, and it is in this area that the mines of the D.C.O.A. group are located. As indicated, the Valley is served by both the Canadian Pacific Railway Company and the Canadian National Railways, as well as by good roads.

Figure 2 shows Drumheller located in that portion of Canada extending from Vancouver Island on the west to Toronto on the east; major railways are also shown. Virtually all of the area covered in Figure 2 and reasonably adjacent to these railroads and their branch lines has been or is marketing area for the D.C.O.A. mines.

Nacmine, Drumheller and East Coulee are all located within the Valley of the Red Deer River with an average altitude of 2670 ft. above sea

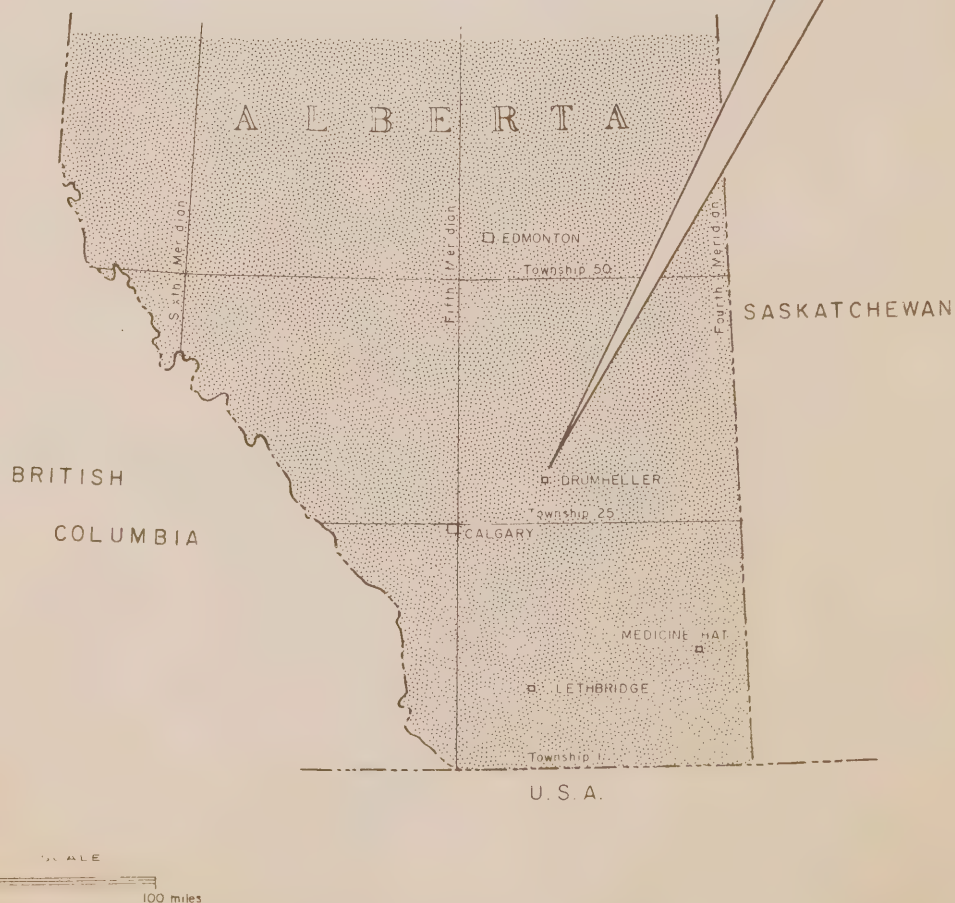
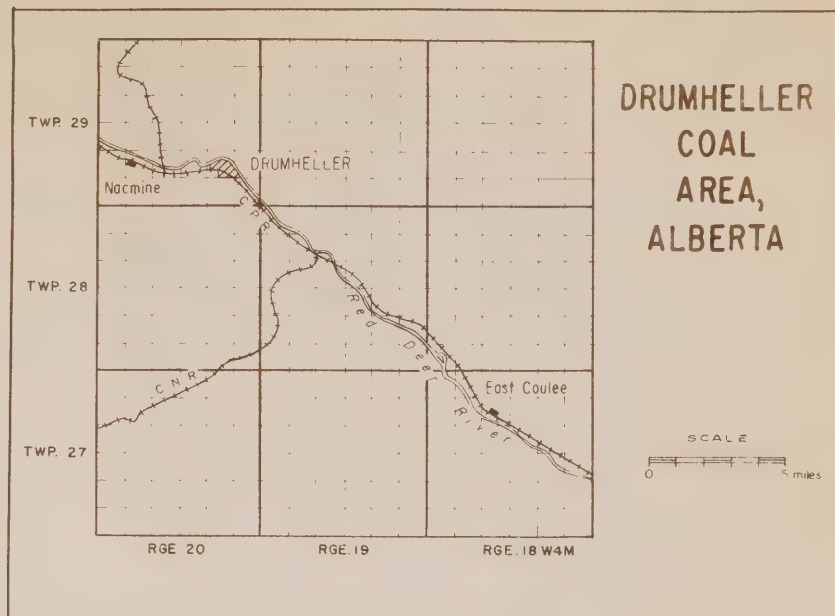


FIG. 1

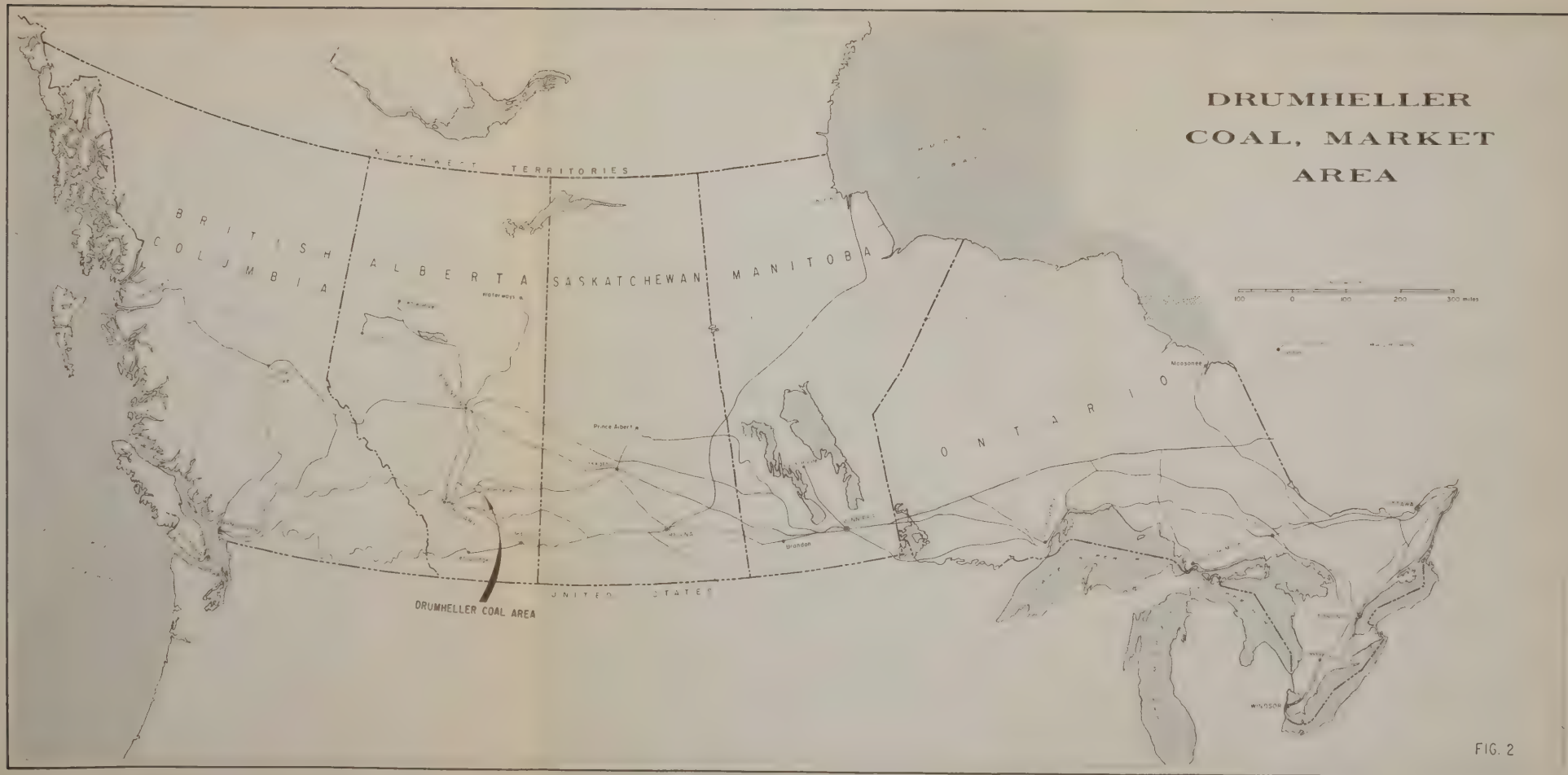
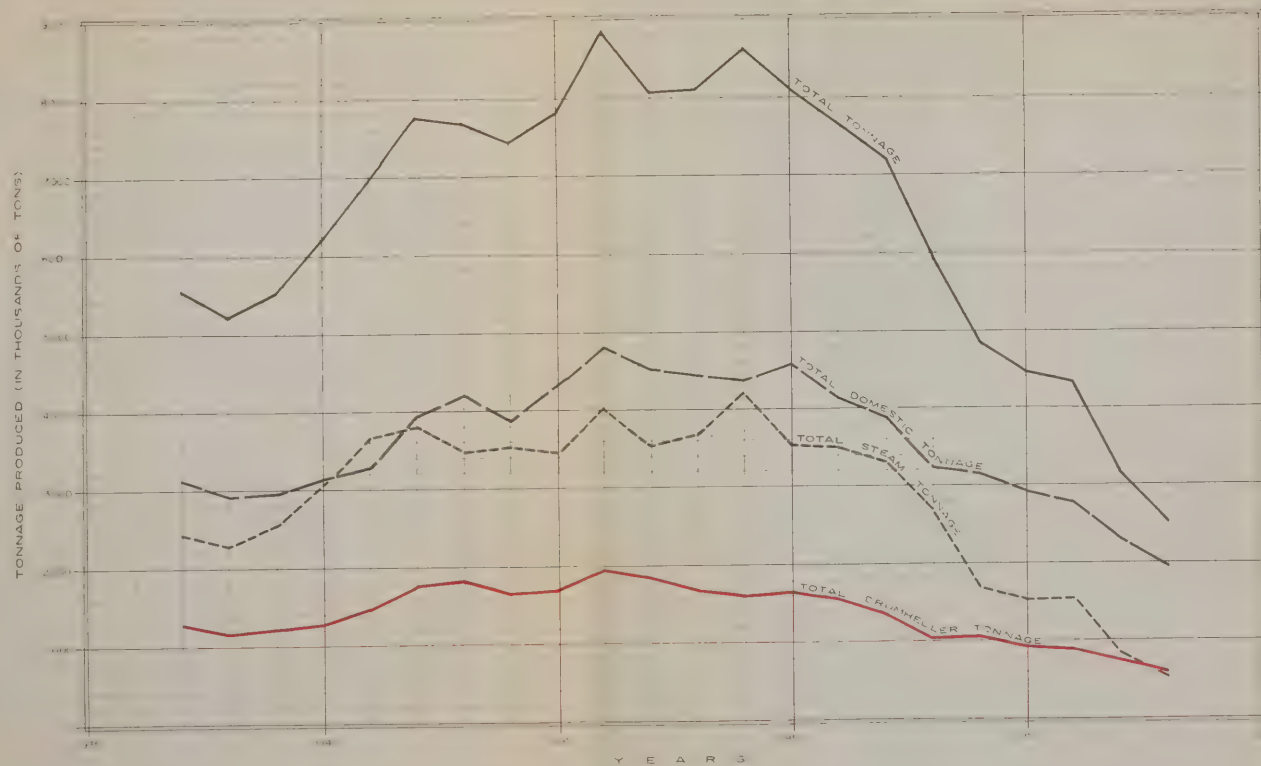


FIG. 2

TABLE A

Details of Alberta Coal Production 1937 - 1958 incl.

| Year | Total Alberta Tonnage | Total Steam Tonnage | Total Domestic Tonnage | Total Drumheller Tonnage |
|------|-----------------------------|---------------------------|------------------------------|--------------------------------|
| 1937 | 5,551,682 | 2,414,003 | 3,137,679 | 1,289,971 |
| 1938 | 5,230,025 | 2,287,805 | 2,942,175 | 1,168,348 |
| 1939 | 5,518,105 | 2,556,801 | 2,961,304 | 1,223,338 |
| 1940 | 6,205,088 | 3,069,197 | 3,135,891 | 1,287,935 |
| 1941 | 6,970,064 | 3,671,357 | 3,298,707 | 1,458,455 |
| 1942 | 7,754,279 | 3,807,348 | 3,946,931 | 1,785,021 |
| 1943 | 7,677,982 | 3,469,993 | 4,207,989 | 1,838,738 |
| 1944 | 7,427,433 | 3,551,205 | 3,876,228 | 1,678,132 |
| 1945 | 7,801,248 | 3,460,736 | 4,340,512 | 1,722,816 |
| 1946 | 8,824,455 | 4,013,182 | 4,811,273 | 1,946,170 |
| 1947 | 8,074,596 | 3,547,318 | 4,527,278 | 1,857,416 |
| 1948 | 8,111,013 | 3,680,746 | 4,430,267 | 1,678,352 |
| 1949 | 8,616,983 | 4,240,310 | 4,376,673 | 1,608,598 |
| 1950 | 8,118,206 | 3,526,937 | 4,591,269 | 1,636,424 |
| 1951 | 7,661,276 | 3,509,333 | 4,151,943 | 1,566,102 |
| 1952 | 7,194,472 | 3,315,880 | 3,878,592 | 1,371,899 |
| 1953 | 5,917,423 | 2,692,670 | 3,224,753 | 1,028,067 |
| 1954 | 4,859,136 | 1,704,862 | 3,154,274 | 1,058,594 |
| 1955 | 4,456,578 | 1,539,363 | 2,917,215 | 933,957 |
| 1956 | 4,329,639 | 1,547,256 | 2,782,383 | 905,717 |
| 1957 | 3,155,354 | 845,923 | 2,309,431 | 763,673 |
| 1958 | 2,519,939 | 545,194 | 1,974,745 | 590,860 |



DETAILS OF
ALBERTA COAL PRODUCTION
1937 - 1958 INCLUSIVE

level. The valley has been eroded by river action to a depth of 500 ft. below the central Alberta plain.

GEOLOGY.

Geology of the area is covered in:

- (a) Geology of Drumheller Coal Field, Alberta, by Allan, 3rd Annual Report of the Mineral Resources of Alberta, 1921, being Report No. 4 of the Scientific and Industrial Research Council of Alberta;
- (b) Coal Areas of Alberta by Allan, 1943, Research Council of Alberta Report No. 34, Part V.

Quoting from Allan the Edmonton formation, which is the top of the Upper Cretaceous formation, occurs at the surface throughout the area under discussion, and in Drumheller the Edmonton is of the order of 850 ft. thick.

The general area contains some 430 square miles of which 75 square miles are underlain with coal. (Reference Page 10 Report of the Mines Division, Province of Alberta 1958).

There are ten recognized seams in the area, of which the most important are Nos. 1, 2, 5 and 7 numbered in order from the bottom of the series. For all practical mining purposes the seams can be considered flat-lying, the regional dip of the strata having been determined at about 20 ft. to the mile in a west-southwesterly direction.

COAL CHARACTERISTICS.

Most of the coal has been, and all of the coal from the D.C.O.A. mines is being produced from No. 1 or No. 2 seams which are the lowest

seams in the Edmonton formation. The coal is classified under A.S.T.M. standards as Subbituminous B. There is some slight variation in analysis among the member mines ranging between the following limits:

| | Percentage | | |
|--------------|------------|---|------|
| Moisture | 18.3 | - | 16.7 |
| Ash | 7.6 | - | 5.7 |
| Volatile | 31.2 | - | 31.4 |
| Fixed Carbon | 42.9 | - | 46.2 |

The sulphur content ranges from 0.2 to 0.3% and can be considered negligible. Calorific values range from 9540 to 10390 B.T.U. per lb. These samples were taken and the analyses made by the Division of Fuels, Mines Branch, Ottawa, 1958.

The coal is clean to handle, low in ash and free burning. It makes an ideal domestic fuel in the larger sizes ranging from the hard blocky lump down to and including stoker. For space heating and industrial uses, the coal makes a desirable fuel from nut down to and including slack.

MINING PROGRESS

Mining operations commenced in 1911 with shafts and slopes being sunk to intercept a given seam below the Valley floor. Over the years, generally speaking, a room and pillar method of mining has been evolved. At first, underground haulage consisted of small mine cars usually less than one ton capacity hauled by ponies. Mining was accomplished by hand pick, handheld drills, blasting with black powder, and hand loading. The mines

have mechanized through the years until at this date virtually all the coal is undercut; sometimes also topcut and sheared. The coal is mechanically drilled and usually shot with compressed air which allows control of pressures up to 10,000 lb./sq. in. so that under a given condition the lowest shooting velocity can be used for the purpose of dislodging coal with minimum degradation. Coal is mechanically loaded into mine cars of 5-ton capacity, fast and efficiently hauled by trolley and battery locomotives. In certain instances mechanical timbering machines are used, and in all mines collapsible roof jacks are used, enhancing face operations pending replacement by permanent timbering which is always a necessity.

On the surface the mines efficiently screen, pick and load the coal into the various marketable sizes.

Table B illustrates the growth of underground mechanization by showing the total connected electrical horsepower underground through the years as compared with tonnage produced and the number of mines operating.

The development of mechanized mining methods entailed experimental efforts and purchase of machinery. Resultant modification of mining methods progressed through use of various types of equipment and has been entirely at the cost of the operators. During World War II minor loans were made for the purpose of purchasing equipment to increase coal production. These loans were repaid. The figures are given in the Report of the Royal Commission on Coal 1946. In fact, except for railway subvention on coal to Ontario which has entailed small tonnages, the Drumheller area has not received any direct or indirect form of assistance.

TABLE B

DRUMHELLER FIELD STATISTICS

| <u>Year</u> | <u>Tonnage Produced</u> | <u>Number of Mines</u> | <u>Aver. No. of Men Employed</u> | <u>Underground Mines: Tons/ Man/Shift</u> | <u>Total Elec. H.P. used below ground</u> |
|-------------|-----------------------------|----------------------------|--|---|---|
| 1911-16 | ? | | | | |
| 1917 | 760,558 | | | | |
| 1918 | 1,001,159 | | | | |
| 1919 | 919,751 | | | | |
| 1920 | 1,355,316 | | | | |
| 21 | 1,147,529 | | | | |
| 22 | 1,356,373 | | | | |
| 23 | 1,233,126 | | | 3.43 | |
| 24 | 1,006,913 | | | | |
| 25 | 1,109,596 | | | | |
| 26 | 1,383,959 | | | | |
| 27 | 1,459,955 | | | | |
| 28 | 1,489,452 | | 1,987 | | |
| 29 | 1,574,766 | 27 | 2,129 | | 3,993 |
| 1930 | 1,432,873 | | 2,275 | | |
| 31 | 1,070,710 | | 1,978 | | |
| 32 | 1,245,673 | | 2,012 | | |
| 33 | 1,112,277 | 25 | 1,834 | | 4,684 |
| 34 | 1,033,649 | 24 | 1,721 | | 4,580 |
| 35 | 1,261,239 | 25 | 1,779 | | 4,983 |
| 36 | 1,439,905 | 27 | 2,009 | | 5,602 |
| 37 | 1,289,765 | 28 | 1,888 | | 5,263 |
| 38 | 1,167,993 | 25 | 1,619 | | 5,487 |
| 39 | 1,223,338 | 21 | 1,685 | | 4,519 |
| 1940 | 1,287,935 | 22 | 1,715 | | 5,194 |
| 41 | 1,458,455 | 23 | 1,698 | | 6,248 |
| 42 | 1,785,021 | 20 | 1,839 | | 5,797 |
| 43 | 1,838,738 | 21 | 2,087 | | 5,615 |
| 44 | 1,677,582 | 22 | 2,004 | | 6,469 |
| 45 | 1,722,816 | 21 | 2,031 | | 5,857 |
| 46 | 1,946,170 | 20 | 2,116 | | 5,434 |
| 47 | 1,857,416 | 20 | 2,206 | | 6,447 |
| 48 | 1,678,352 | 20 | 2,251 | | 8,122 |
| 49 | 1,608,598 | 20 | 2,093 | 3.71 | 8,622 |
| 1950 | 1,636,424 | 20 | 1,859 | 4.01 | 8,580 |
| 51 | 1,566,102 | 17 | 1,719 | 4.13 | 7,730 |
| 52 | 1,371,899 | 16 | 1,589 | 4.10 | 8,739 |
| 53 | 1,028,067 | 15 | 1,229 | 4.28 | 7,579 |
| 54 | 1,058,594 | 15 | 1,237 | 4.23 | 6,865 |
| 55 | 933,957 | 13 | 1,134 | 4.12 | 7,650 |
| 56 | 905,717 | 14 | 1,036 | 4.12 | 8,154 |
| 57 | 763,673 | 11 | 915 | 4.69 | 7,108 |
| 58 | 590,860 | 9 | 691 | 4.68 | 5,910 |
| 59 | 572,363 | 7 | | | |
| | 55,364,614 | | | | |

The above figures were taken from Annual Mines Branch Reports, Coal Statistics for Canada, and Commission Reports, except 1959.

Even with intermittent work the Drumheller area produced at the rate of 4.68 tons per man day in 1958. In 1959, two large mines ceased operations. Given reasonable rates of production, the four mines of the D.C.O.A. can be assured of an average of 5 tons per man day with an outlook towards an even better record in the future. This output per man day, as far as known, is second only to U.S. underground mines where, in general, physical conditions are more favourable.

PRODUCTION HISTORY

Although mining commenced in 1911 the tonnage record is available only from 1917 - 1959 inclusive. It is probable that the Valley has so far produced the order of 60 million tons of coal. The great problem connected with the Drumheller operations has been seasonal production. From the inception of the industry, except for war years, working time has been confined practically to six months a year, August to January, or at times September to February, depending on the weather.

Up to 1939, many of the mines closed down almost entirely for the other six months. Coal was produced by hand mining methods and miners were available during the working months. In non-working months they obtained employment chiefly in agriculture, or went on relief. The market simply would not absorb coal during this six months of the year.

This condition changed during the interval of World War II due to continuing demand for available fuel but after the war, market conditions tended to revert to pre-war experience. Also, since the war, competitive fuels have come into the picture, namely oil, gas, rural electrical power, and competing strip mined coals.

Among other statistics Table B shows the tons per man day produced for years where government figures are available, and it appears that there is a small and generally increasing trend in rate of production. This, of course, reflects the results of mechanization.

At the same time the labour situation has changed entirely. The old time skilled hand miners have been replaced by machine operators, mechanics, electricians, etc. Such men are also skilled and have, of necessity, had to be trained in the mines. In turn, the mines are dependent upon the services of such employees and, to retain these men, must provide full annual employment.

In order to do this the old system of shutting down in summer has been altered to a system of developing entries and room necks so that in winter when the market demand rises the same crew, aided by additional labour, can produce coal from rooms at the maximum tonnage per man day. This is illustrated by the experience of the D.C.O.A. group for the calendar year 1959, during which production ranged from a low of 2.93 tons per man day to a high of 6.11.

For several years the operators have offered every inducement within their power, by sales efforts, together with summer discounts, extended credit terms, prepaid freight, etc., to market coal in the summer months. Table C shows the fluctuations in monthly demands during 1958 and 1959. The D.C.O.A. finds increasing dealer resistance to buying or stocking coal during the summer, but conversely a demand in cold weather which the mines are unable to meet under present conditions. With such market conditions, the apparent answer is for the mines to store and where possible sell summer production. Then, during

the period of winter demand, the mines must produce at the highest possible rate together with picking up the stored coal. The plain fact is that the mines must be able to ship coal immediately on demand, no matter how erratic such demands may be, or lose markets to competitive available fuels. It is here that the mines require assistance.

TABLE C

COAL OUTPUT - DRUMHELLER AREA BY MONTHS

| | <u>1958</u> | <u>1959</u> |
|----------|---------------|-----------------|
| January | 66,998 | 80,830 |
| February | 52,074 | 55,050 |
| March | 19,163 | 14,778 |
| April | 20,997 | 17,582 |
| May | 21,986 | 12,295 |
| June | 11,667 | 13,210 |
| July | 11,475 | 9,654 |
| August | 31,918 | 37,392 |
| Sept. | 60,050 | 61,306 |
| October | 101,395 | 93,710 |
| November | 94,480 | 92,469 |
| December | <u>98,657</u> | <u>84,087</u> * |
| | 590,860 | 572,363 |

* Estimate

MARKETS

In 1958, 98% of the Drumheller coal production went to the four western provinces, distributed closely as follows:

| | |
|------------------|-----|
| Manitoba | 13% |
| Saskatchewan | 52% |
| Alberta | 19% |
| British Columbia | 14% |
| Ontario | 2% |

It is believed that 1959 will show similar results.

Drumheller coal is screened to certain sizes to suit market requirements but the percentage of each size naturally is governed by the size constituents of the coal as mined, and is shown in Table D.

TABLE D

| | Size | Approx. Percentage |
|--------|-----------------------------------|--------------------|
| Lump | Plus 4 $\frac{1}{2}$ " | 45.5 |
| Egg | 4 $\frac{1}{2}$ " x 2" | 18.0 |
| Nut | 2" x 1.1/8" | 6.8 |
| Stoker | 1.1/8" x 3/4" | 9.2 |
| Slack | 3/4" x 0 | 20.5 |
| | Based on Round Hole Equivalent | |

The various sizes of coal are sold at different prices with lump commanding the highest price, and prices decreasing with sizing.

As previously mentioned, the coal is utilized chiefly for domestic and space heating with the exception of slack which is almost entirely sold to thermal power plants.

GENERAL STATEMENT.

1. There is a continuing market available to the Drumheller mines.
2. Fossil fuels are, and apparently will continue to be, the primary source of energy for many years to come.
3. In Canada coal constitutes a major potential source of fossil fuel.
4. Underground coal mines provide employment in relatively greater measure than other forms of energy. 64% of the total cost of production is paid out for labour, including fringe benefits, by the D.C.O.A.
5. The nation has depended on coal for survival during two wars. This could happen again. Once mines are closed down and abandoned, they can rarely be reopened.
6. Continuation of underground mining even at the small level hereafter suggested will preserve a nucleus of technical knowledge, skilled labour, and continuous progress in production technique which is essential for the future requirements of the country when coal again becomes the major source of fossil fuel.

A technique developed under conditions applicable to some other country is not necessarily effective in Canada or, in fact, in various parts of Canada.

SUMMARY

The D.C.O.A. must maintain a minimum market of 500,000 tons per year. This coal must be supplied by the most efficient and economical method consistent with market requirements. There must be due regard to providing

employment for a permanent staff plus seasonal labour which fits in with unemployment in other industries. The resultant would be a material saving to the general economy.

The D.C.O.A., based on experience, would produce the minimum of 500,000 tons per year at the rate of 90,000 tons during the six months of small demand, and 410,000 tons during the six months of relatively large demand.

In order to achieve this objective the breakdown would be as follows:

1. During summer months the mines shut down completely for a two-week holiday period for which the employees are paid, and which can therefore be considered as equivalent to a work period.

2. Based on a five-day work week there are:

February to July inclusive:

| | | | |
|-------------------------|----------|-----------|----------|
| Possible working days | | 129 | |
| Less: Paid holidays | 10 | | |
| Statutory holidays | 3 | | |
| May 1st, Union holidays | <u>1</u> | <u>14</u> | 115 days |

Proposed work time 100 days

Production: 300 men @ 3 tons/man/day 90,000 tons

August to January inclusive:

| | | |
|--------------------------|----------|----------|
| Possible working days | 131 | |
| Less: Statutory holidays | <u>6</u> | 125 days |

| | |
|--|---------------------|
| Production: 560 men @ 5.9 tons/man/day | <u>410,000 "</u> |
| | <u>500,000 tons</u> |

To the 300 permanent and 260 seasonal employees, at least 5% can be added to account for absenteeism due to all causes.

This programme essentially depends upon shipping coal when possible and storing the balance so as to allow the mining of 90,000 tons in the summer months. Failure to carry out this programme will have three effects:

- (1) The unemployment of 300 men.
- (2) The fact that the D.C.O.A. realizes the impracticability of attempting to operate mines without skilled crews who would not be available on a six-month work basis. The mines would have to close permanently.
- (3) The capital necessary to replace the mines and equipment in the Drumheller field is in excess of \$5,000,000. It must be realized that the investment in the mines is lost unless coal is produced both in summer and winter.

The D.C.O.A. cannot supply statistics as to the effect of a closure of their mines on the earnings of employees of the logging industries, of railway workers, truckers, merchants and subsidiary local industries, but they believe such effect would be substantial.

There is admittedly no simple answer to the D.C.O.A. problem.

Experience has shown that a small market is obtainable in Ontario and that the present railway subvention applicable to Drumheller coals is essential to that market. Shipments have fluctuated from a high in 1941 of 131,121 tons through a low of 38 tons in 1943, to 12,728 tons in 1958. This subvention should be retained.

The major marketing area lies in the four Western provinces and to maintain these markets assistance is required to enable a programme which will allow the mines to meet existing conditions. This definitely entails a

minimum production of coal during the summer months as indicated previously .

Where coal cannot be shipped it must be stored at the mine. The cost of such storage of Domestic coal is high. The coal requires screening and the laying down of sized coal on a bed of impacted slack. The coal must be spread over a large area, then covered with slack to avoid weathering, and spontaneous combustion. It is also desirable to treat the coal piles chemically to keep out the weather.

With all possible care, considerable degradation is inevitable and, upon pick up and rescreening, parts of the larger sizes are down-graded to smaller sizes. The D.C.O.A. can supply figures showing that the approximate total cost of storage is \$3.00 per ton.

The mines would be kept in operating condition for any eventuality, labour provided with jobs and consumers supplied with essential coal requirements by a combination of remedies which would not, in themselves, be unduly expensive or entail any long range capital costs.

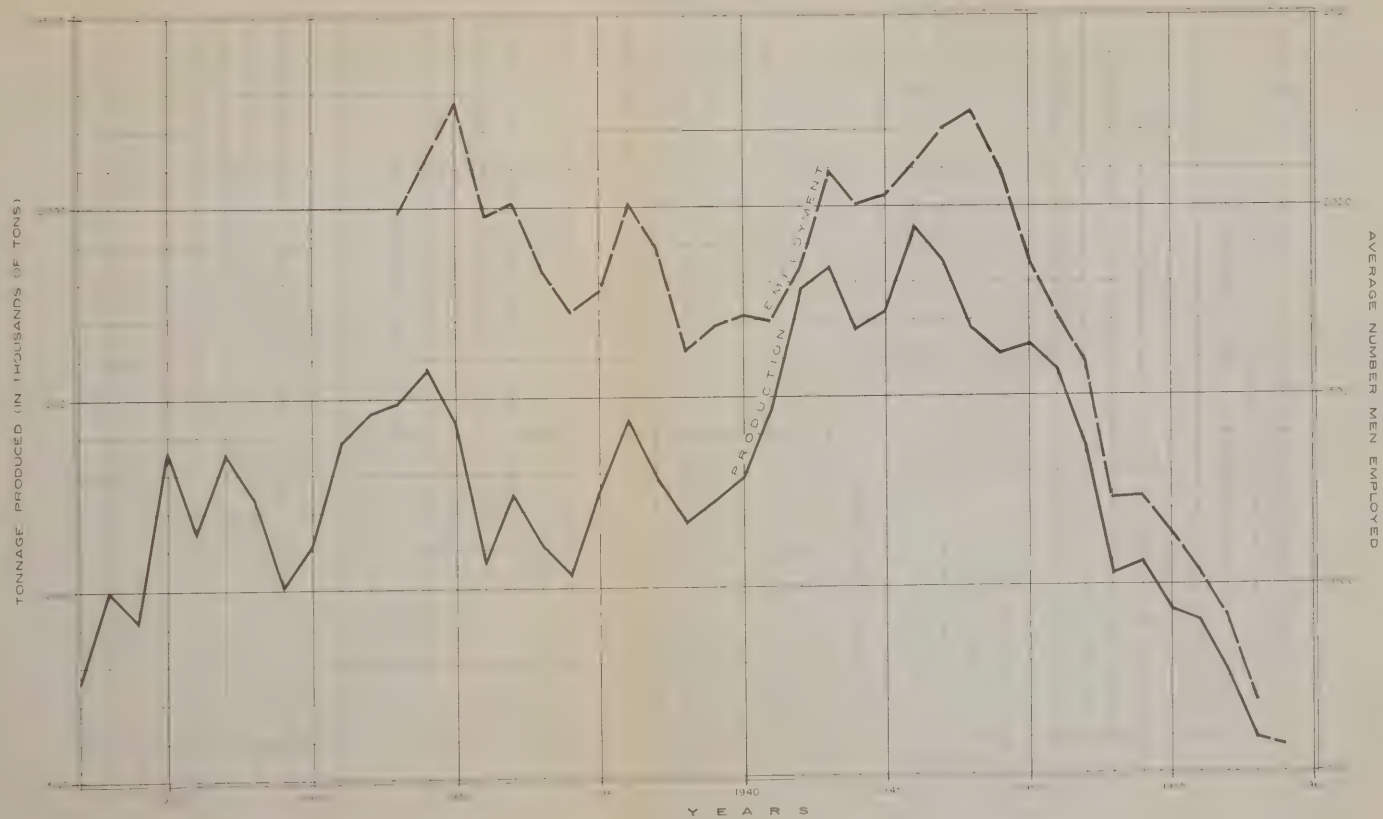
To ensure a continuance of the mines in this field, the following proposals are made, details of which could be worked out between government and management.

PROPOSALS.

- A. Assistance of \$3.00 per ton on lump and egg coal put to storage at the mine either above or below ground during the summer season and picked up for sale in the winter season. A subvention of \$3.00 per ton on these grades sold and shipped during the summer period.

- B. A subvention of \$1.00 per ton on approximately 75,000 tons of stoker and nut coal covering the entire year.
- C. The total annual assistance envisaged in the above suggestions would be in an amount not to exceed \$300,000.
- D. That such assistance to the industry be reviewed from time to time in order to maintain the required minimum market.
- E. That research work on coal being carried on by the Division of Fuels, Ottawa, and the Research Council of Alberta, be continued and expanded if possible.

The requested assistance represents less than 4% of the current outlay for subvention purposes on all Canadian Coals.



DRUMHELLER COAL AREA
PRODUCTION AND EMPLOYMENT RECORD

